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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09 785,815

02/16/2001

Yeuk-Fai Edwin Mok

4969 USA ISM/COPPER/SB

4127

32588

7590

02/26/2003

APPLIED MATERIALS, INC.  
2881 SCOTT BLVD. M/S 2061  
SANTA CLARA, CA 95050

EXAMINER

MACARTHUR, SYLVIA

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 02/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

FILED

## Office Action Summary

## Application No.

09/785,815

## Applicant(s)

MOK ET AL.

## Examiner

Sylvia R MacArthur

## Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 16 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 14-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 16 February 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

*Election/Restrictions*

**DETAILED ACTION**

*Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-13, drawn to an apparatus, classified in class 156, subclass 345.11.
  - II. Claims 14-18, drawn to a process, classified in class 216, subclass 92.
  - III. Claims 19-22, drawn to a system, classified in class 156, subclass 345.11.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus can be used to practice for a materially different process such as coating.
3. Inventions I and III are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination such as the apparatus can be performed by itself. The

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subcombination has separate utility such as for transporting a substrate without processing the substrate.

4. Inventions II and III are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus or the system can be used to practice different process such as transporting a substrate other than etching the substrate.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Keith Tackett on 12/30/02 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-13. Affirmation of this election must be made by applicant in replying to this Office action. Claims 14-22 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-5,9 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Dordi et al (WO 00/32835).

Dordi teaches a loading station 210 preferably includes a loading station transfer robots 228 and at least one wafer orientor 230. The wafer orientor 230 (substrate centering hoop) positions each wafer 234 in a desired orientation to ensure that the wafer is properly processed.

The pedestal actuator 334 rotates the pedestal to spin the substrate and raises and lowers the pedestal. The system of Dordi also adjusts the orientation and placement of nozzles so that the unwanted deposits can be removed along the edge of the substrate to create an edge exclusion zone. The mainframe 214 comprises a transfer station (transfer position), a spin-rinse dry (SRD) station 212 (rinse position).

The fluid/chemical delivery assembly 2106 comprises one or more nozzles 2150 disposed on one or more dispense arms 2152 which dispenses rinsing fluid and etchant. The dispense arm 2152 includes one or more conduits extending through the dispense arm for connecting the nozzle 2150 to an etchant source.

The loading station transfer robot 228 (actuator) also transfers wafer 234.

***Claim Rejections - 35 USC § 103***

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10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 6 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dordi in view of Nayak et al (EP 1136592).

The teachings of Dordi were discussed above.

Regarding claim 6, Dordi fails to teach a slit valve.

Nayak teaches an edge bead removal chamber 502 which includes a slit valve 512.

The motivation to provide a slit valve is to provide a means of allowing the wafer access to the chamber while limiting the amount of contamination of the process environment due to transfer.

Additionally, Dordi fails to teach the rotating nozzles of claims 11-13.

Nayak teaches a rotary actuator 154 that extends or retracts the dispenser arm by rotating the post 521 that is rigidly connected to the dispenser arm.

The motivation for such adjustable nozzles is that fluid can be directed to the substrate at different angles and thus ensure a uniform process result.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide a slit valve and rotatable nozzles in the system of Dordi.

12. Claims 7,8, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dordi in view of Stevens et al (USP 6,516,815).

The teachings of Dordi were discussed above.

Regarding claims 7 and 8 Dordi fails to teach a spindle assembly.

Stevens teaches an apparatus (edge bead removal module 100) for etching a substrate comprising a rotation actuator attached to the substrate support 104 and a fluid delivery assembly 106 to deliver an etchant to the peripheral portion of a substrate disposed on the substrate support. The substrate support 104 comprises a vacuum chuck 124 and the fluid delivery assembly comprises one or more nozzles 150.

The wafer holder assembly 104 (spindle assembly) further includes a lift assembly (linear actuator) 118 and a rotation assembly 120. The lift assembly facilitates transfer and positioning of the wafer 122 on the wafer holder assembly 120, which also comprises a rotary motor attached below the lift assembly.

The motivation for a spindle assembly to provide support and multidirectional movement of the substrate, which enhances the capability of the support device in the system.

Additionally, Dordi fails to teach rotatable nozzles.

Figure 3 illustrates that the wafer lift 130 comprises a spider clip assembly with a plurality of arms 134.

The fluid/chemical delivery assembly 106 comprises one or more nozzles 150 disposed on one or more dispense arms 152 (etchant and rinse nozzles). The nozzles 150 deliver fluid to the upper and lower edge surfaces of the wafer. The nozzles deliver deionized water source 160 (rinsing agent) and etchant source 162. The nozzles 150 are disposed at an angle (allows for rotation of nozzles) to provide fluids near a peripheral portion of the wafer. The wafer is rotated in the same direction as the direction of the etchant spray pattern. Fig. 6 shows a substrate in a

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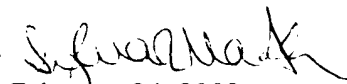
processing position vertically disposed between fluid inlets. Col. 6 lines 31-35 discusses nozzles connected to an actuator (motor).

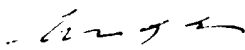
*Conclusion*

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R MacArthur whose telephone number is 703-306-5690. The examiner can normally be reached on M-F during the core hours of 8 a.m. and 2 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

  
February 24, 2003  
Sylvia R. MacArthur

  
BENJAMIN L. UTECH  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY SECTION